

# The Impact of Star Formation & Galactic Environment on the Circumgalactic Medium

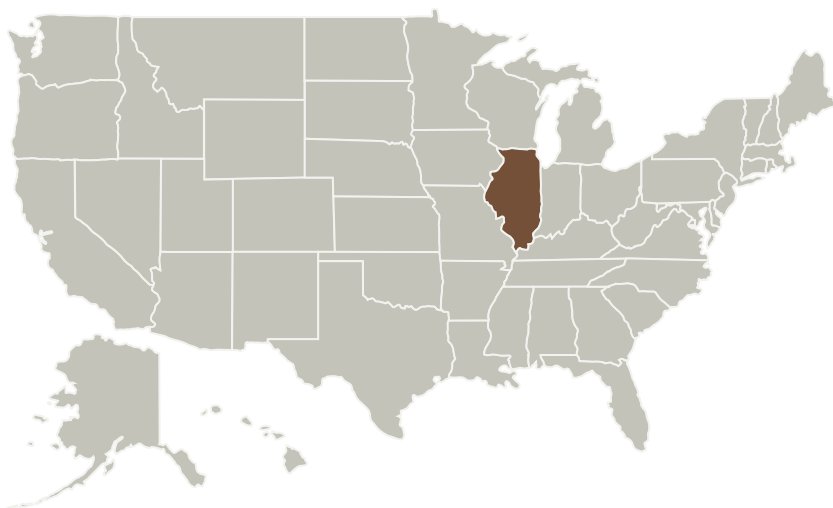
Completed Technology Project (2015 - 2018)



## Project Introduction

This awarded program (ASTRO15F-0121) is to understand two major aspects of how the gaseous halo of galaxies depends on the interplay from models of star formation--feedback loop and the galactic environment. We aim to study the CGM by combining approaches from cosmological galaxy simulations and UV spectroscopy in observations. Absorption spectroscopy of background QSOs provides a powerful probe for studying the complex baryonic cycles in galactic halos that are otherwise invisible. Commonly seen absorption features of the low-redshift circumgalactic medium (CGM) occur in the UV spectral regime, which are only accessible in space. The Cosmic Origins Spectrograph on board the Hubble Space Telescope has offered a unique opportunity to advance the field of CGM studies. The proposed research will combine UV QSO absorption spectra obtained using COS and the state-of-the-art cosmological zoom-in simulations to gain deeper understandings of the origin and evolution of chemically enriched gas in circumgalactic space. Specifically, it will first address the question of how galactic environments impact the CGM based on the first large sample of galaxy groups at low redshift. Next, it will combine observed CGM properties and simulations to predict and refine the star-formation feedback models. The research program will provide a better understanding of how galaxies seen today came about, and will contribute to a key question on the journey of discovery defined in the NASA mission: to explore the origin and evolution of galaxies.

## Primary U.S. Work Locations and Key Partners



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## Organizational Responsibility

### Responsible Mission Directorate:

Science Mission Directorate (SMD)

### Responsible Program:

Astrophysics

## Project Management

### Program Manager:

Joe Hill-kittle

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Organizations Performing Work	Role	Type	Location
University of Chicago	Supporting Organization	Academia	Chicago, Illinois

## Primary U.S. Work Locations

Illinois

## Project Management (cont.)

### Principal Investigator:

Hsiao-wen Chen

### Co-Investigators:

Carol Zuiches

Jia Liang

## Technology Areas

### Primary:

- TX09 Entry, Descent, and Landing
  - └ TX09.4 Vehicle Systems
    - └ TX09.4.5 Modeling and Simulation for EDL

## Target Destination

Outside the Solar System